THURSDAY, FEBRUARY 18, 1897.

OUR MARKETABLE MARINE FISHES.

The Natural History of the Marketable Marine Fishes of the British Islands. By J. T. Cunningham, M.A. Pp. xvi + 368, 2 maps, and numerous cuts. (London: Macmillan and Co., Ltd., 1896.)

THE great Fisheries Exhibition held in London in 1883 gave a marked impulse to the study of our sea-fisheries, and drew the attention both of scientific men and of the more enlightened of the general public to the importance of the subject and to the necessity of endeavouring to "arrive at an accurate estimate of the causes which determine the movements and the variations in abundance of the animals which produce the harvest of the sea." The Marine Biological Association of the United Kingdom, founded shortly afterwards (1884), has done much during the last decade to trace out the life-histories and habits of many of our food fishes; the scientific investigations of the Fishery Board for Scotland, and the researches carried on at Prof. M'Intosh's marine laboratory at St. Andrews, have done still more; and other public bodies and individuals round the coast have assisted in a less degree in collecting the information which has made possible such a book as the one before us.

Mr. Cunningham, who has been employed since 1887 as "naturalist" by the Marine Biological Association at their Plymouth laboratory, produced some years ago a finely illustrated monograph on the common sole; and now, under the direction of the Council of the same body, he has prepared this work on our marketable marine fishes, with the view of bringing before the general reader, in a connected narrative form, the gist of the information contained in the numerous technical memoirs which have appeared from various laboratories during the last few years. It is generally agreed that the fisherman might with advantage know a great deal more than he does about the objects of his search, but there are some of us who think that at the present juncture what is most required is an educated public opinion. It is probably as important for the future of fisheries investigation and improvement, and of just legislation in regard to the fisheries, that the general public should have opportunities of learning and realising the truth in regard to the habits and life-histories of food fishes, and the inter-relations of animals in the sea, as it is that the fisherman himself should be instructed in such matters. In addition to public lectures, by competent authorities, and the establishment of technical fisheries museums, the publication of books such as the present one, and the larger work which we understand Prof. M'Intosh is preparing, should not only prove useful to those who are, *or ought to be*, interested in fishery matters, either for profit or from the legislative point of view, but will serve as a guide in forming opinions on those fishery questions which have now to be discussed and decided by County Councils and Committees for Technical Instruction, by Conservancy and other Boards, in Law Courts and in the House of Commons.

The Marine Biological Association has been aided by large grants from Her Majesty's Treasury on the understanding that special attention should be directed to the investigation of sea-fish and sea-fisheries, and the present volume will naturally be taken as stating the general conclusions arrived at by Mr. Cunningham, the member of the staff especially charged with the fishery investigation, both from his own work and the consideration of the work of other naturalists at various points around the British coast. Under these circumstances it is to be regretted that Mr. Cunningham has not made more use than appears in his book of the statistics and other local investigations of the Lancashire Sea-Fisheries Committee. Most of his statements are taken from observations made at Grimsby and at Plymouth; but the Irish Sea forms an English fishing area second only in importance to the North Sea, and from which examples might well have been quoted. Even in the appendix, dealing specially with the fishing grounds of the British Islands, the Irish Sea is conspicuous by its absence, and no reference is made either to the "inshore" or "offshore" Lancashire trawling-grounds.

Prof. Ray Lankester, as President of the Marine Biological Association, introduces the book with a preface in which he states as his opinion that "nothing short of a physical and biological survey of the North Sea and of the area within the hundred-fathom line on our southern and western coasts can yield the information as to the movements of marine food fishes and the distribution of fishing grounds which is needful if we are to deal intelligently with our sea-fisheries." With that opinion we heartily concur. It is practically what the present writer urged in a presidential address to Section D of the British Association in 1895, when he said . . . "it would be a very wise action, in the interests of the national fisheries, for the Government to fit out an expedition, in charge of two or three zoologists and fisheries experts, to spend a couple of years in exploring more systematically than has yet been done, or can otherwise be done, our British coasts from the Laminarian zone down to the deep mud." I may now add that in such a scheme I should *not* omit the Irish Sea—a natural sea-fisheries district, with breeding grounds and feeding grounds, estuaries, and open sea, great expanses of shallow banks, and coasts where you can go "from the Laminarian zone down to the deep mud," at eighty fathoms, in about twelve miles.

Mr. Cunningham's book is divided into two parts. Part I. is general, and deals with the history of fisheries investigations, the general characters and distribution of marine fishes, their methods of reproduction and their development, their growth, migration, food, and habits; and finally a discussion of practical methods for increasing the supply of fish. Part II. is special, and takes up the history of particular fishes arranged according to their families, from the "Herrings" to the "Suckers." Part I. is interesting reading; Part II. is more the work of reference in which to look up the details of certain species. The interesting story of Sars' discovery in 1864 and 1865, of the floating eggs of the cod, haddock, and mackerel in Norway, and of M'Intosh's important work in Scotland, of the work of the Kiel Commission in Germany, and of the Fishery Board for Scotland, are all given in

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the first chapter. But in this historical section the reference to the Sea Fisheries Committees round the coasts of England and Wales is too brief, and their work is practically ignored.

Even though the book is written not for the specialist, but for the general public, we think too obvious and elaborate an attempt has been made to avoid technical terms. Some of the "English" substitutes are no improvement from any one's point of view, and are wanting in precision and sense—for example, we find mammals referred to as "the tribe of beasts," and, curiously enough, after using the term "pectoral fin" at the beginning, the author discards it during the remainder of the book in favour of "breast fin." Then again, when such a technical term as "micropyle" is used, there seems no reason for calling the oviduct "egg-tube"; while to label an unfortunate little blenny "the Gattorugine" is quite as bad as to use its proper scientific name. We should have been glad to have seen the scientific names of the species associated with the English names throughout the book, and especially under the useful outline figures. It is easy to pick up the scientific names, and the sooner those of the public who are concerned with fishery matters do so the better. On p. 40, when defining species, genera, and families, the names of a few well-known genera, such as *Gadus*, and *Clupea*, and their more important species, might have been introduced with advantage.

Although we quite agree with Mr. Cunningham's remark, that at present it must be held that artificial propagation of sea-fish is in its experimental stage, still we think that throughout that discussion on practical methods he does not, in stating the case for hatching, allow sufficiently for the fact that the embryos are protected in the hatchery during a period of their existence when, if at large, they are liable to become the prey of nearly everything in the sea that has a mouth.

There are some misprints in the book, which should have been corrected in proof: *e.g.* on p. 87, *Lota vulgaris* is called the turbot; Prof. M'Intosh's name is misspelled throughout the book, as is also *Hydrallmania*, which should have only one "n."

There are some other points one might take exception to, but we have criticised enough; and most of the blemishes we have alluded to above are of minor importance, and leave the book a really valuable work and a record of much research and long-continued industry on the part of the author. We hope that the book will prove useful in the hands of superintendents of fishery districts and members of our Sea Fisheries Committees. The numerous illustrations are most of them excellent, and the general "get-up" is all that could be desired.

W. A. HERDMAN.

THE LIFE OF JAMES CROLL.

Autobiographical Sketch of James Croll, with Memoir of his Life and Work. By J. C. Irons. Pp. 553. (London: Stanford, 1896.)

THE life of James Croll is very remarkable. That a mason's son, who in youth laboured on the few acres of his father's homestead; who then, having a mind disposed to mechanics, became apprentice to a millwright; who, having served his four years' time, got employment at eight shillings a week, having sometimes to walk thirty or forty miles a day to his work, and to sleep in the barn; who, not becoming inured to such hardships, turned carpenter, and met with some measure of success, till disease in the elbow set in; who then, not having sufficient education for a clerkship, found employment in the tea trade, and was after a time helped by his employer to open a shop for his own profit—in which venture he might have succeeded, even in spite of reading "Edwards on the Will," had not the elbow caused a long and painful illness which ruined the business, and left him with an ossified joint; who then supported himself for a twelvemonth by making electrical instruments wherewith the neighbours might cure themselves of all the ills the flesh was heir to; who, when the demand for the panacea was exhausted, "after due consideration," set up a temperance hotel in a town, Blairgowrie, of 3500 inhabitants, with sixteen inns and public-houses there already, and far from any railway; who, after a year and a half of failure as innkeeper, took to canvassing for various insurance companies, where, as usual, everything went contrariwise with him—that a man, who thus spent nearly the first forty years of his life, should have become so successful a student of metaphysics as to write a work of decided merit on "The Philosophy of Theism," is perhaps not a matter of surprise, seeing that he was a Scotchman. But we may surely indulge our faculty of wonder when we learn that a London publisher was found ready to undertake the whole risk of publishing his work, by an unknown Scotch tradesman or agent, on the terms of half profits, and that the result justified the publisher's enterprise.

But at length, in 1859, these difficulties were overcome, and Croll obtained a situation as janitor at the Andersonian College, Glasgow. The salary was small, but he had ample time to read, and some excellent libraries to consult; and here he may be said to have begun his scientific career. After eight years he was appointed to the Geological Survey of Scotland, where he remained thirteen years. Through ill-health he then retired, expecting to have received a pension calculated on age as well as length of service; but in this he was disappointed. The Treasury refused to pay more than 75*l*. 16*s*. 8*d*. a year. The circumstances of the refusal, as set forth in the correspondence, render the transaction a lasting disgrace to the Treasury. Ten years later he died.

There is here a striking record of difficulties overcome. Yet these, the external difficulties, were the least with which Croll had to struggle. His head, always a bad servant to his mind, became, in 1865, so seriously affected, that never afterwards could he persist for any length of time in mental work, or concentrate his energy on a difficulty until it was overcome. If he attempted to do too much, not only did the pain become unbearable, but he was disabled for several days afterwards. How terribly this affliction influenced his life may be judged from the fact, mentioned in Croll's simple, modest way, that he had to take a by-path in the morning, lest conversing with a friend on the way should unfit him for his office work.

Even from this bare outline it may be judged that the

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